CASE OF
PERFORATION OF THE MASTOID CELLS:

SUBSEQUENT FORMATION OF AN ABSCESS BENEATH
THE STERNO-MASTOID MUSCLE.

BY

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B. J—, æt. 58, a clergyman, of healthy constitution, applied to me on the 22nd of February, 1867, on account of a discharge from the left ear. A month before, after officiating in a cold and draughty church, he was seized with pain in the ear, which continued severe for eight days, when a discharge appeared. The relief that followed was, however, of short duration, and pain and discharge had since continued unabated. There had been no previous disease of the ear, except a slight and temporary deafness some years before, after influenza.

On examination there was found an abscess in the left tragus, which nearly closed the ear. This was opened, and the meatus was found to be much swollen, and its surface desquamating. The membrana tympani was red, and presented an irregular orifice in the lower part, about a line and a half in diameter, through which air passed freely when the patient inflated the tympanum. During the three days he remained in London, the ear was freely washed with a weak

solution of sulphate of zinc and morphia, and a large quantity of discharge removed from the tympanic cavity. On his returning to the country the same lotion was directed to be used twice daily; air being at the same time passed through the tympanum, and the ointment of iodide of potassium with extract of aconite to be rubbed around the ear. No relief, however, followed. Severe attacks of pain recurred regularly about 3 a.m. For these quinine was given (two grains every four hours), and the pain diminished for a time but soon returned, severe and constant, over the vertex and back of the head. Some tenderness also was at one time found about an inch behind the meatus, but this passed off.

On March 12th I again saw the patient. There was then no swelling or tenderness over the mastoid process. Very large quantities of tenacious secretion were removed by syringing, from the tympanum, its exit being aided by the use of sulphate of zinc, and the passage of air through the Eustachian tube. The meatus was more healthy. The orifice in the membrana tympani was larger, and the exposed mucous membrane of the tympanum appeared red and irritable. The membrana tympani had lost its redness, and was of a dull white hue. A physician was consulted, who advised change of air and prescribed a mercurial purgative with sulphate of bebeerine. A lotion of borax and opium was advised.

In the course of a week the patient returned again from the country, with an increase of pain; and a slight degree of swelling and tenderness were found over the mastoid process. The discharge continued profuse; not very fetid. An incision through the periosteum of the mastoid process was now advised, but owing to the great reluctance of the patient it was deferred, and on the next day, under the use of fomentations, the swelling and tenderness had almost entirely disappeared. A succession of small blisters was advised, and for a few days the patient appeared to improve. On the 30th of March, however, I received a letter from his wife, stating that the pain had greatly increased, especially at the

vertex, and that there was an increase of the swelling around the ear, with general feeling of illness. Under these circumstances I visited the patient, and found that indications of disease affecting the mastoid process had assumed a decided character. The part was much swollen, red and tender; there was constant severe pain at the top of the head, greatly aggravated by coughing or sneezing. Pulse 100; frequent cold perspirations.

Without further delay an incision one inch and a half in length was made through the periosteum, covering the mastoid process, about half an inch behind the ear. The soft tissues were swollen to upwards of an inch in thickness. Considerable relief followed, but not complete; and on examination the next day I found that there was a slight roughness and softening of the bone, about the central and lower part of the process. Through the most softened part I introduced a medium-sized trocar, boring without much difficulty to the depth of a little more than half an inch. On withdrawing the instrument a free stream of dark grumous pus followed; not offensive. The opening was enlarged and more pus escaped. The wound was kept open by oiled cotton.

The pain was at once almost perfectly relieved. In twenty-four hours the discharge from the meatus entirely ceased, and on the third day after the perforation of the bone, the orifice in the membrane was healed; air blown into the tympanum no longer escaping into the meatus. Bare and softened bone was felt at the bottom of the wound. On the tenth day no more bare bone was to be felt, and the wound was healing. *Membrana tympani* of a dull pinkish hue; in the position of the orifice was a thick white patch. Air entered the tympanum with a slight creaking sound. There was no swelling, but a slight pain in the side of the head, at about 4 p.m. daily; this, however, soon subsided, and in a few days more there remained only a small sinus, at the bottom of which no bare bone could be detected. The hearing also had very considerably improved.

At this time (about the middle of April) the patient spent

a month at Torquay, during which, after some exposure, there was a return of pain, intermittingly, in the ear and head, which did not entirely subside. But on examination, on his return to town, no sign of local mischief was detected, and he went into Norfolk. There the attacks of pain increased, especially at the vertex, and some shiverings occurred, after which a large firm swelling formed in the side of the neck, bounded above by the mastoid process, and extending downwards and forwards for about four inches in the course of the sterno-mastoid muscle. Four leeches had been applied without relief. There was much febrile disturbance, and frequent and profuse perspirations. No fluctuation was discernible. A slight oozing of pus, however, had continued from the small sinus which existed in the position of the incision previously made, and from this sinus a little dark matter could be squeezed on pressing the swelling upwards.

May 24th.—The former incision was extended downwards about half an inch, the knife being carried deeply into the softened bone, so as to lay the mastoid cells freely open. Free bleeding took place, and blood also escaped into the pharynx, evidently passing through the Eustachian tube. The bleeding was controlled by pressure on the anterior part of the mastoid process. A blunt probe passed freely into the bone for the distance of about an inch and a half, and gave exit to some red-coloured matter, and in the course of the day about a dram oozed out with some relief to the pain. The bulk of the swelling, however, remained entirely unaffected.

26th.—Pain less; a slight escape of purulent matter, not fetid, on the poultices. Swelling in the neck undiminished; a puffiness extending anteriorly over the region of the carotid.

A very small trocar and canula were introduced at the most prominent part of the swelling, about two inches below the mastoid process, and through the substance of the sterno-mastoid muscle. At the depth of about an inch and a half a drop or two of reddish matter escaped on withdrawing the trocar, and on introducing a larger canula, nearly half an

ounce was evacuated. The canula was left in the wound, and spongio-piline applied. Pus continued to flow, and the pain in the head became much less. It was distinctly aggravated, especially at the vertex, whenever the discharge of matter ceased. On the fifth day free bleeding took place from the wound, which, however, was stayed by pressure before many ounces had been lost, and did not return.

On the 8th day Mr. Cadge of Norwich saw the patient in consultation: wound kept open by lint. Swelling less.

Fifteenth day (June 9th). Swelling diminished and more circumscribed. Pains in the head not less severe, but always relieved by the escape of matter. A curved probe, introduced through the wound, after passing inwards about an inch and a half, could be turned in all directions, evidently in the cavity of an abscess; most freely downwards. A slight discharge escaped now and then from the superior opening, but no connection could be traced between it and the abscess.

Perforated laminaria tents were introduced, which were very effective in giving free exit to the matter, but were too painful to be continued.

The condition being evidently an abscess of considerable size beneath the sterno-mastoid muscle, and probably within its sheath, it was considered necessary to have recourse to further procedures, and on 12th June the patient was removed to London. He was here seen by Mr. Paget, and on the next day, by the advice and with the kind assistance of that gentleman and Mr. Cadge, the abscess was laid freely open in its whole extent by means of a curved bistoury and director; the incision being made continuous with that originally made over and into the mastoid process. The bleeding from the divided occipital artery was controlled by plugging. No dead bone was exposed by this incision, nor was any subsequently detected; although for a time a probe could be passed for nearly two inches into a small sinus-like canal at the bottom of the wound. This, however, soon closed, and the wound healed in about two months. In September, three months after the opening of the abscess, and six

months after the perforation of the mastoid process, the patient enjoyed his customary amusement of shooting.

March, 1868.—The orifice in the membrana tympani continues soundly healed, showing a small scar ; the hearing of the affected ear is but little impaired, ordinary conversation being heard with ease, and a low watch at a distance of six inches.

In respect to the formation of the abscess beneath the sterno-mastoid muscle, consequent on inflammation within the mastoid cells, this case stands, so far as I am aware, by itself. It is, however, only one of several which seem to establish the benefit of perforation of the mastoid process, if performed sufficiently early. Of such cases I have met with an account of fourteen, in twelve of which the operation gave perfect relief, while in two fatal mischief already existed within the skull. Of these, eight, all successful, one being his own, are collected by Dr. Von Troeltsch in Virchow's 'Archiv' for 1861 :—three, of which two were successful, are reported by Dr. Pagenstecher in the 'Archiv für Klinische Chirurgie' for 1863 ;—one, successful, by Dr. Schwartz in his 'Praktische Beiträge Zur Ohrenheilkunde,' p. 37 ;—one, also successful, by Dr. Flaiz in the 'Archiv für Ohrenheilkunde,' vol. i, and one, in which relief was given, but pyæmia had already set in and proved fatal after some weeks, by Dr. Mayer in the same 'Journal,' vol. ii. Of these cases the one, related by Dr. Flaiz presents many points of similarity to my own. It is briefly as follows :

A clergyman, æt. 46, in good health, was attacked with inflammation of the left meatus and tympanum. In a few months fever set in, with twitchings of the left arm and shoulder. The membrana tympani was perforated, air passing through it on inflation. Swelling and tenderness over the mastoid process. After leeching, without relief, an incision was made through the periosteum, evacuating half an ounce of pus ; the bone was not rough. The pain ceased, but as the wound healed it returned with great severity. Delirium came on at night, and the left arm was in constant motion. There were two especially painful spots ; one at the occiput the other on the left parietal protuberance.

The incision was reopened, and a perforator introduced on a level with the external meatus. The cellular structure was reached at a depth of three lines, the instrument being carried somewhat forward and upward. The opening was then enlarged by a probe; but no matter appeared until after thirty-six hours, when an abundant discharge ensued and lasted for some days. In four weeks the patient resumed his duties, free from all symptoms, and contented with his hearing.

The indications for the perforation of the mastoid process are essentially the same as those now generally recognised as demanding an incision through the periosteum covering it, with the addition that entire relief is not given by the latter procedure. The symptoms are severe and continued; there is pain in the ear or head, especially on moving, which is accompanied or preceded by a discharge from the ear, and by tenderness on pressure over the mastoid process. If, in addition, symptoms of cerebral irritation are present, or if the bone on exposure is found bulging or softened in certain parts, the necessity for perforation is of course more evident.

I omit from the list of indications swelling and redness over the mastoid process, for although these symptoms are generally present, yet it appears that they are sometimes absent when perforation of the bone affords the only prospect of saving life: in those cases, for example in which necrosis extends from the meatus or tympanum, not downwards so as to involve the mastoid cells, but inwards into the upper portion of the pyramid. In such cases there may be little or no swelling externally, and yet an opening through the upper portion of the mastoid process, about on a level with the roof of the meatus externus, may enable the necrosed portion to escape, or at least may give a safe outlet to the fluid that surrounds it.

A case of this kind, but in which the attempt was made too late, is reported by Dr. Pagenstecher ('Archiv für Klinische Chirurgie,' vol. iv, p. 529).

It is scarcely necessary to observe that shortly after its

successful performance by Jasser in 1776, perforation of the mastoid process was frequently resorted to as a remedy for deafness, until the death of Dr. Burger, in 1791, led to the total abandonment of the proceeding. It would of course never be proposed now except to avert a pressing danger.

In conclusion, I may briefly relate another case, very similar in some respects to the preceding, but in which perforation of the mastoid process was not performed :—

October 12th, 1866.—B. T—, æt. 60, a publican, but of moderate habits, was seen by me with Mr. Geo. Roper. Three months before he had suffered from severe pain and discharge of pus from the right ear, which have continued since in a less degree. For the last week the pain has again been more severe. He had been subject for two or three years to pain and swelling in various joints, but these have been absent since the ear became inflamed. The hearing was almost abolished on the right side; the mastoid region was slightly swollen and tender, but not red. The posterior wall of the meatus, just in front of the membrana tympani, was red and projecting so as nearly to fill the passage, and from amongst some granulations on this surface pus was seen to issue. No dead bone, however, could be felt. Air could not be passed into the tympanum, and the use of the Eustachian catheter was refused. No fever; tongue clean. Leeches were applied; and an incision over the mastoid process advised, but the patient would not consent until the end of a week, when all the symptoms had become aggravated. An incision was then made, but no dead bone was found, nor did any pus escape from the wound, though on pressure a large quantity flowed from the meatus. Air was passed through an orifice in the membrane.

Great relief was given to the pain; but the patient became weaker, and in the course of a fortnight a large abscess had formed in the pharynx on the right side. This was opened (also after delay on the patient's part) by Mr. Roper, and discharged freely, as also did the wound behind the ear. Still no dead bone was felt. On November 19th, four months

after the commencement of the attack, he died with symptoms of pyæmia.

The post-mortem examination was conducted by Mr. Roper, to whom I am indebted for the temporal bone, and for the following brief report.

The substance of the brain seemed unaffected, and the membranes also, except a patch of ecchymosis on the basilar process of the right sphenoid bone; but the bone itself was not involved. The parts beneath the base of the skull were infiltrated with pus, and formed to a large extent the sac of an abscess, which was bounded superiorly by the base of the right petrous bone. There were also other abscesses in various parts of the body, the largest of which was situated over the right scapula.

Right temporal bone.—The mastoid process was reduced to a mere shell, breaking down under slight pressure, but not carious externally. The internal portion formed a cavity in which lay a carious fragment of bone, about the size of a large bean, and evidently consisting of the remains of the cellular structure. The jugular sinus was obliterated, and the portion of the vein attached to the bone contained a sanious mass. The dura mater at this part was thickened and white, but not ulcerated. The walls of the tympanum did not appear to be carious, and the bony meatus seemed healthy. The membrana tympani was soft and swollen, and presented a small perforation at the posterior and superior part.

On looking at the preparation I think it is hard to resist the conclusion that an external opening into the mastoid cells might have saved the patient's life. But it seems to me also worth consideration whether (considering the small size of the orifice in the membrane, which was scarcely discoverable in the recent state, and in the dry membrane does not equal a line in its greatest length) a free enlargement of this orifice, so as to allow an easy escape of fluids from the tympanum, on the first access of symptoms of extended irritation, might not have been even more efficacious.